I went down to the British commodore's stateroom on USS Iwo Jima one evening because he came to my stateroom and said, 'You have to come see this!' He had four screens up with live chat going from us aboard Iwo Jima to the UK commander in Norfolk on this releasable SIPRNET, down to the Theodore Roosevelt Strike Group, over to the Spanish ship Alvaro de Bazán (F101). We were doing live chat for four different systems all at one time.

Those are some of the things that NETWARCOM has helped us work through. A lot of the time, the problem is not hardware but specific protocols and getting the authority to interoperate.

Are we there yet? No. Have we identified where we need to get to? Yes, we have. And we are getting there a lot faster than anybody anticipated at this point. All players, whether it is FBI, whether it is the State Department, the UK as a NATO partner, whether it is the Spanish government as a coalition partner — everybody understands — and everybody is trying to move toward that.

We just have to continue to adapt and do the hard detail work. But it is work that is making our country a safer place everyday.

CHIPS: Is there any final comment you would like to leave us with today?

Rear Adm. Anderson: I firmly believe that one of the most important things we have to get better at across not only DoD, but all of the other agencies, is explaining to the American people what we are doing to make their military more effective in the 'Long War' that is GWOT (global war on terror). How we are making America a safer place.

The Goldwater-Nichols Act was designed to make DoD become joint and interoperable. The operations in Grenada proved to us years ago that the Services didn't even have radios that could talk to each other. We have matured dramatically since those days and are indeed interoperable today.

Interoperable is nothing more than ensuring my people and equipment works with your people and equipment. This is important, but it is not good enough any more. We need to get to the point where we are truly interdependent, which means I cannot do my job without you, and you cannot do your job without me.

This level of coordination demands trust and an in-depth understanding of every players' strengths and weaknesses. We need to get to this point not only within DoD, but within the other government agencies as well. What you are going to see here today is how Second Fleet is making this concept a reality today. CHIPS

For more information about U.S. Second Fleet, go to http://www.secondfleet.navy.mil/.

By Sharon Anderson

The Joint Expeditionary Force Experiment 2006 is the sixth in a series of U.S. Air Force biennial highly focused, multinational, multi-Service military experiments. JEFX supports multi-functional exploration, spiral development and rigorous assessment of initiatives in the areas of command and control, space, information management, combat forces, mobility, combat and logistics support, and homeland defense. The Main Experiment (MAINEX) executed April 18-28, 2006.

JEFX 06 is the first experiment to leverage the integration efforts of experimentation and link them directly with test and evaluation to prepare the Combined Air and Space Operations Center (CAOC) weapon system for expedited operational fielding.

The goals for this experiment are to better integrate CAOC processes, expand the use of data links, extend networks linking operational and tactical levels of execution, and improve coordination processes for collecting, fusing and disseminating information in support of homeland security and defense.

"JEFX 06 is a true experiment. It is Air Force directed," said Second Fleet science adviser, Tom Forbes. "Navy plays in JEFX to interoperate, to be interdependent with the Air Force on the same operational level. We experiment with the latest and greatest in technology. We take away lessons learned, and we make recommendations as to what to do with the 'so what' after we have finished with the experiment and the analysis work. Do we accelerate production or do we let it mature more in the laboratories and industry floors before we turn it over to the warfighters?"

The Navy portion of JEFX 06 is sponsored and led by the Naval Network Warfare Command (NETWARCOM), the operational agent for the Navy's FORCEnet program under Sea Power 21. Second Fleet is the overall fleet lead for JEFX 06.

STIMS

The Navy Warfare Development Command (NWDC) coordinates the Sea Trial component of the Sea Power 21 vision, the Navy's experimentation program. The Sea Trial Information Management System (STIMS) for concept development and experimentation, developed by the NWDC, is an interactive, secure database located on the NWDC SIPRNET Web site (nwdc.navy.smil.mil/stims). STIMS serves as the central library of initiatives, events and projects to manage Sea Trial events and related activities, as well as to support cataloging all experimentation.

After the experiment, the evaluation process includes the appropriate Fleet Collaborative Team, the operational agent, and ultimately the Sea Trial Executive Steering Group. STIMS is also the repository of analysis and assessment documents that are linked to Sea Trial experimentation proposals and initiatives.

The Experiments

Each of the Navy's four JEFX 06 initiatives has its own STIMS unique identifier, Forbes explained. The objective of STIMS No.

et Lead in Joint Expeditionary Force Experiment 2006

Tom Forbes, Second Fleet science adviser.

2042, Global Hawk Maritime Demonstrator (GHMD)/Maritime Domain Awareness (MDA), is to explore the processes, procedures, systems and time lines for GHMD to support and provide maritime operational and intelligence data to maritime homeland security/maritime homeland defense (MHLS/MHLD) nodes across military components in support of specific maritime domain awareness surveillance requirements.

The GHMD system will also be used to further develop long endurance unmanned aerial vehicles (UAV) concept of operations (CONOPS) and tactics, techniques and procedures (TTP).

The Naval Air Systems Command (NAVAIR) acquired two Global Hawk aircraft as part of the GHMD project administered by the Program Executive Office for Strike Weapons and Unmanned Aviation (PEO(W)) and its subordinate Program Management Office for Unmanned Aerial Vehicles (PMA-263).

The Navy is committed to buying a high-altitude, long-endurance unmanned air system, according to Forbes. The Navy's plan is to use the unmanned air system as a surrogate for the procurement plan. The experiment used simulation testing due to delays in delivery of the first air system to the Patuxent River Naval Air Station. One test flight of about two hours duration was conducted during the experiment; however, it was not a data collection flight for purposes of the experiment.

"The first airplane will probably show up around 2012. The Air Force had already developed Global Hawk as a part of an advanced concept technology demonstration. Navy decided if we are going to buy into a program like this, a unique, revolutionary airplane that flies for a long time (a day and a half, perhaps) at high altitudes so it is not interfering with commercial aircraft, we ought to learn how to operate it before we develop the procurement program," Forbes said.

The air system consists of Synthetic Aperture Radar (SAR), Ground Moving Target Indicator (GMTI), maritime surveillance and Inverse SAR Radar. The Global Hawk came with existing Air Force sensor software, which the Navy modified. The Air Force model was optimized for land search and surveillance. But the boundary conditions are different between land search and water search. In the land environment, the only thing that is moving is the target, but over water, the ocean surface is moving continuously, but targets do not move rapidly. ISAR records the echo signals of moving targets such as ships and displays the unique characteristics that make them different from land targets.

"We added a maritime surveillance mode for the radar maritime target acquisition that results in dots or target locations on the common operating picture. We added Inverse Synthetic Aperture Radar, known as ISAR. It is good over water because it cancels out the background of the water's movement; it only looks at the characteristics associated with ships in the ocean— pitch and roll and yaw. As the ship moves, it reveals itself and its characteristics over an ISAR picture," Forbes said.

Electronic Support Measures is essentially an electronic vacuum cleaner that sucks up electronic emissions from the targets and provides line of bearing information to the ground station. This is a unique Navy package that is in the air system. It downlinks information to the ground station called the Tactical Auxiliary Ground Station (TAGS), which is paired with the Mission Control Element (MCE) at Patuxent River, Md.

A tremendous amount of data are sorted at the TAGS, according to Forbes. Individual tracks are nominated to the Naval North Fleet East, which is Second Fleet's name in its homeland security/homeland defense role to U.S. Northern Command. Imagery from the ISAR radar and/or electro-optical or IR (infrared) sensors go to the Office of Naval Intelligence, Fleet Imagery Support Team and National Maritime Intelligence Center in Suitland, Md., where imagery analysts examine the data and provide associations between the analyzed imagery and the target.

"We pair the two together and nominate those tracks to a common operating picture, provide that to U.S. Fleet Forces Command and from there they are disseminated over the GCCS-M (Global Command and Control System – Maritime) transport path," Forbes said.

Imagery is also sent to the Coast Guard Maritime Intelligence Fusion Center located at Dam Neck, Va., which may send the picture to Coast Guard Headquarters. USNORTHCOM and the Joint Force Maritime Component Commander (JFMCC) North, which is Fleet Forces Command, provide a picture to the CAOC at Nellis Air Force Base, and up to the Pentagon.

"We are looking at how we integrate the products from that air system with other sensors and database information so that we can positively locate, characterize, identify and persistently track candidate vessels in the maritime domain," Forbes said.

The Navy is working with the Coast Guard because certain sections of Titles 10 and 14 preclude members of the Army, Navy, Air Force or Marine Corps from direct participation in law enforce-

ment activities. Some of those law enforcement activities would include interdicting vehicles, vessels and aircraft; conducting surveillance, searches, pursuit and seizures; or making arrests on behalf of civilian law enforcement authorities. The Coast Guard is not restricted from acting in this regard.

"We are looking to be able to sort the suspect vessels from all the rest and then have the ability to disseminate that information, not only among Navy stations and resources, but provide that information to interagencies, Coast Guard, FBI and other agencies that might be interested, including U.S. Customs and Border Protection," Forbes said.

In the Maritime Dynamic Targeting (MDT), STIMS No. 2041, and Time Sensitive Targets (TST) piece, the Navy wants to develop the process by which maritime forces prosecute MDT and TST. This experiment provided the opportunity and means to focus technology development for marine command and control and targeting to speed up targeting capability. The experiment also was an opportunity for input into the development of JFMCC command and control, targeting and fires doctrine, and TTP.

Maritime Dynamic Targeting objectives include testing joint interoperability, timeliness and accuracy, and appropriateness of response. MDT demonstrated the interoperability, interdependence and connectivity between the Combined Forces Air Component Commander, the Combined Forces Commander, the Joint Task Force Commander and Second Fleet using the same software suite that the air component uses at Nellis Air Force Base, called the CAOC Common Client.

Cross component collaboration means that when the Air Force or the Navy develops a target, it becomes available for anybody to execute a strike on that target.

"For Maritime Dynamic Targeting we have developed a CONOPS, and we have refined that through spirals. We have refined the standard operating procedures to the point where we are now. It seems to be working well, so well that the Air Force has adopted the same kind of processes and procedures in its operations center at Nellis Air Force Base," Forbes said.

Tactical IP Networks, STIMS No. 2040, and Link 16, STIMS No. 2039, presented the concept of the airborne network evolving from voice-based command and control at the operational level to a more complex network of data shared in many forms by many users. Machine to Machine (M2M) targeting using Link 16 is a legacy system that constituted the backbone of Navy experimentation in JEFX 04. Further experimentation is needed to enhance Blue Force situational awareness and improve the Navy's ability to receive and transmit imagery and conduct Digital TST.

A desired outcome of this part of the experiment is that imagery using the J16.0 message and targeting data can be transmitted through the current infrastructure with acceptable latency and that the images are of sufficient quality to reduce the kill chain time to execute.

The Global Hawk unmanned aircraft.

Airborne Tactical Internet Protocol (Tac IP) experimentation allowed the exploration of maturing technologies that have the potential to significantly enhance information flow around the battle space. JEFX 06 employed Tactical Targeting Network Technology to investigate Tac IP networks potential use and role within net-centric operations.

"Tactical IP Network takes the ground-based, terrestrial IP networks that you are familiar with and puts them in the air. Now you have airplanes interoperating over an IP network at high bandwidth, with high data rates that we heretofore have not been able to do," Forbes said. "Link 16 experiments with nontraditional intelligence, surveillance and reconnaissance by passing imagery back and forth."

Anybody on the ground that has access to the IP network and the cockpit can send imagery, messages, chat or Voice-over-IP. Having received the images, the pilot can identify the target on the ground, execute a strike, take an image of the target with the on-board equipment, send it to the CAOC, and there is almost immediate results on the bomb damage. The success story here is high bandwidth in the cockpit and rapid transmission of tactical data.

"Whoever puts eyes on a target, transmits this information through the network to the CAOC. Then one or more of the applications in the MOC nominates the strike through the Battle Management Command and Control (BMC2), whether it is an E2 Hawkeye or an AWACS, and that is passed to an F-15 E1, a special aircraft made by Boeing," Forbes said.

The Boeing F-15 E1 is special because it allows the installation of two different types of operational flight software; one is the actual release, and the other can be used for experimentation.

The Maritime Operations Center

While Forbes provided details about the experimentation, watchstanders in the MOC were participating in the exercises as events unfolded. In the cubicle marked "ISR OPS" Cmdr. Mark Hottendorf and Operations Specialist Senior Chief Kevin Albright were using IWS, or InfoWorkSpace, an interactive virtual environment that allows geographically dispersed teams to collaborate and share information in real-time.

"We use a couple of tools that are under development to update what is going on when we are trying to get approval. It could be

U.S. Air Force Maj. Jim "Irish" Kockler, from Air Combat Command, is the project officer for Maritime Dynamic Targeting testing at 2nd Fleet. He helps develop tactics, techniques and procedures.

Cmdr. Mark Hottendorf (right, foreground) and OSCS Kevin Albright using InfoWorkSpace, a real-time virtual environment for information sharing.

dropping bombs on a target or denying airspace to someone, or getting ships or aircraft from one place to another," Hottendorf said.

The software tested called WEEMC, or Web Enabled Execution Management Capability, is the interim name for a new system that will be called JADOCS-NC or Joint Automated Deep Operations Coordination System – Net Centric. It allows coordination between different levels of the command structure to agree on courses of action. When the board signals green across all levels of command, it means that the course of action has been approved and units are assigned to execute the order.

"Basically, we are concerned with the maritime component, which are the ships and the aircraft that are operating at sea. There is also a Land Component Commander, which is Army and an Air Component Commander, which is Air Force. We have cross-coordination between those component commanders, and that's also done via this tool as well," Hottendorf said.

Coordination across levels of command takes mere seconds, but evaluating operational options may be more complicated.

"The decision on the courses of action may take several minutes. We may have to consult with the JAG, the Judge Advocate General, concerning the rules of engagement and collateral damage estimates. Once we have discussed those courses of actions, the actual approval takes a matter of seconds," Hottendorf said. "In this experiment we are taking some of the older doctrine and putting a new spin on it. We are developing new tactics, techniques and procedures and using these tools to help develop new doctrine."

New technology does not drive the need for new doctrine; it only enhances it, according to Albright. "The tool helps the process go faster. The people in different areas and at Nellis are coordinating off this same tool.… It is like a relay race; someone starts off the process and then hands the baton to the next person."

"Technology is enabling us to do things at a quicker rate, but we still need to make sure that if we do something that quickly that we do not have friendly fire, and we do the proper thing and still allow the commanders on the field to take the initiative to do what they need to do without reaching down and micromanaging," Hottendorf said.

JEFX consists of three spiral events, in addition to MAINEX. Spiral 1 is essentially a technology demonstration of the command and control tools or "initiatives" where warfighters can provide feedback to the developers. The developers use the feedback to modify the tools or initiatives before Spirals 2 and 3.

During Spirals 2 and 3, the warfighters, manning an operationally representative combined air operations center, use the initiatives and systems, assess them for their operational utility and submit desired changes. The ultimate aim of the experiments is to accelerate development to get capabilities into the hands of warfighters faster.

The only U.S. Air Force member in the MOC, Maj. Jim "Irish" Kockler, is the Second Fleet project officer for Maritime Dynamic Targeting. Kockler said he was excited about MDT test results.

"Things are going better than I expected. After Spiral 3, as far as the Maritime Dynamic Targeting is concerned, we accomplished what we wanted to accomplish during MAINEX the last time we got together. Now we are advancing the football down the field a little more during this MAINEX. We are doing a good job. 'Dr.' Forbes thinks the same way. I do not think we came into this to write a Tactical Memorandum on this process, but I think that is going to be the end result," Kockler said.

Maj. Kockler helps 2nd Fleet develop tactics, techniques and procedures. Lessons learned during this experiment may become part of Navy doctrine, according to Kockler.

"Someone else will take our lessons learned and put those into a document. For example, Naval Warfare Development Command has written the concept of operations, and we are employing the work that they have done and are experimenting with it. They will make changes based on how we perform, and it ends up being a Navy Tactical Memo." CHIPS